

Application No. 10/660,851

Amendments to the Claims

The following listing of the claims will replace all prior versions, and listings of the claims in the application:

Listing of Claims

1. (Previously presented) An optical disk which comprises a track groove and on which positional information indicating a physical location on the track groove is represented by a wobble shape of the track groove,

wherein the optical disk includes a plurality of positional information units that are arranged on the track groove, and

wherein each said positional information unit includes:

a positional information section that represents the positional information by a combination of wobble patterns selected from multiple types of wobble patterns that have been defined so as to correspond to respective signal waveforms that rise and fall mutually differently;

a sync mark section having a wobble pattern in a shape distinguishable from the wobble patterns of the positional information section; and

a precision positioning mark section ahead of each said positional information section, wherein the positional information is read out from the optical disk by:

detecting the sync mark section that has been formed on the optical disk;

detecting the precision positioning mark section;

establishing a bit synchronization for the positional information using the sync mark section detected and/or the precision positioning mark section detected; and

reading out the positional information in accordance with the bit synchronization established in the step of establishing the bit synchronization for the positional information.

2. (Previously presented) An optical disk which comprises a track groove and on which positional information indicating a physical location on the track groove is represented by a wobble shape of the track groove,

wherein the optical disk includes a plurality of positional information units that are arranged on the track groove, and

wherein each said positional information unit includes:

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a positional information section that represents the positional information by a combination of wobble patterns selected from multiple types of wobble patterns that have been defined so as to correspond to respective signal waveforms that rise and fall mutually differently;

a sync mark section having a wobble pattern in a shape distinguishable from the wobble patterns of the positional information section, and

a precision positioning mark section ahead of each said positional information section, wherein data is written on the optical disk by:

detecting the sync mark section that has been formed on the optical disk;

detecting the precision positioning mark section based on the sync mark section detected;

performing positioning using the precision positioning mark section detected; and

starting to write the data based on a positioning result obtained in the positioning step.

3. (Previously presented) An optical disk which comprises a track groove and on which positional information indicating a physical location on the track groove is represented by a wobble shape of the track groove,

wherein the optical disk includes a plurality of positional information units that are arranged on the track groove, and

wherein each said positional information unit includes:

a positional information section that represents the positional information by a combination of wobble patterns selected from multiple types of wobble patterns that have been defined so as to correspond to respective signal waveforms that rise and fall mutually differently;

a sync mark section having a wobble pattern in a shape distinguishable from the wobble patterns of the positional information section, and

a precision positioning mark section ahead of each said positional information section, said precision positioning mark section including an identification mark for use in precision positioning, wherein an optical disk drive for reading out positional information from the optical disk comprises:

means for detecting the sync mark section that has been formed on the optical disk;

means for generating a first detection window with a predetermined time width

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after a predetermined time has passed since a timing at which the sync mark section was detected by the sync mark section detecting means;

means for detecting the identification mark, which has been formed on the optical disk, by using the first detection window;

means for establishing a bit synchronization for the positional information, which is recorded on the optical disk, by reference to the timing at which the sync mark section has been detected and/or a timing at which the identification mark has been detected; and

means for reading out the positional information at a timing at which the bit synchronization has been established by the means for establishing the bit synchronization for the positional information.

4. (Previously presented) An optical disk which comprises a track groove and on which positional information indicating a physical location on the track groove is represented by a wobble shape of the track groove,

wherein the optical disk includes a plurality of positional information units that are arranged on the track groove, and

wherein each said positional information unit includes:

a positional information section that represents the positional information by a combination of wobble patterns selected from multiple types of wobble patterns that have been defined so as to correspond to respective signal waveforms that rise and fall mutually differently;

a sync mark section having a wobble pattern in a shape distinguishable from the wobble patterns of the positional information section, and

a precision positioning mark section ahead of each said positional information section, said precision positioning mark section including an identification mark for use in precision positioning, wherein an optical disk drive for writing data on the optical disk comprises:

means for detecting the sync mark section that has been formed on the optical disk;

means for generating a first detection window with a predetermined time width after a predetermined time has passed since a timing at which the sync mark section was detected by the sync mark section detecting means;

means for detecting the identification mark, which has been formed on the optical disk by using the first detection window; and

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data writing means for setting a data writing start point or end point by reference to a timing at which the identification mark has been detected.

5. (New) An optical disk comprising a track groove including a plurality of positional information units, wherein:

each positional information unit includes a positional information section and a sync mark section,

each positional information section includes a plurality of unit sections, each unit section has a wobble pattern selected from a plurality of wobble patterns including a first wobble pattern having a first displacement shape and a second wobble pattern having a second displacement shape, and

the first displacement shape is defined so as to correspond to a signal waveform that rises relatively steeply and falls relatively gently compared with a fundamental waveform, and the second displacement shape is defined so as to correspond to a signal waveform that rises relatively gently and falls relatively steeply compared with the fundamental waveform.

6. (New) The optical disk of claim 5, wherein each of the unit sections has one-bit information of address information.

7. (New) A method of reading information from the optical disk as recited in claim 6, the method comprising:

irradiating the optical disk with light;
generating an electrical signal responsive to a portion of the light reflected from the optical disk; and
detecting the one-bit information of the address information based on the electrical signal.

8. (New) An apparatus for reading information from the optical disk as recited in claim 6, the apparatus comprising:

an irradiating unit operable to irradiate the optical disk with light;
a generating unit operable to generating an electrical signal responsive to a

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portion of the light reflected from the optical disk; and

a detecting unit operable to detecting the one-bit information of the address information based on the electrical signal.